CONTENTS

Volume 10 Number 1 1996

1 Editors' report

Essay Review

4 The CO_2 dependence of photosynthesis, plant growth responses to elevated atmospheric CO_2 concentrations and their interaction with soil nutrient status. I. General principals and forest ecosystems
J. LLOYD & G. D. FARQUHAR

33 Lifetime leaf carbon balances of herbaceous perennial plants from low and high altitudes in the central Alps
M. DIEMER & CH. KÖRNER

44 Plasticity in root/shoot partitioning: optimal, ontogenetic, or both?
J. J. GEDROC, K. D. M. McCONNAUGHAY & J. S. COLEMAN

51 Activity and foraging behaviour in the predatory freshwater leech *Nephelopsis obscura* (Erpobdellidae)
R. W. DAVIES, E. DRATNAL & L. R. LINTON

55 Leaf-cutting ants (Formicidae, Attini) prune their fungus to increase and direct its productivity
M. BASS & J. M. CHERRETT

62 Metabolic differences between the postbreeding, moulting and migratory periods in feeding and fasting passerine birds
S. JENNI-EIERMANN & L. JENNI

73 Metabolic responses to diurnal feeding patterns during the postbreeding, moulting and migratory periods in passerine birds
L. JENNI & S. JENNI-EIERMANN

81 Malate dehydrogenase phenotype, temperature and colony effects on flight metabolic rate in the Honey-bee, *Apis mellifera*
J. F. HARRISON, D. I. NIELSEN & R. E. PAGE JR

89 Does early growth cause a phenotypically plastic response in egg production of the Atlantic salmon?
N. JONSSON, B. JONSSON & I. A. FLEMING

97 Effect of short-term feed restriction, realimentation and overfeeding on growth of Song Thrush (*Turdus philomelos*) nestlings
M. KONARZEWSKI, J. KOWALCZYK, T. ŚWIERUBSKA & B. LEWOŃCZUK

106 Stress-induced fitness reduction is not determined by the most sensitive life-cycle trait
J. E. KAMMENGA, M. BUSSCHERS, N. M. VAN STRAALEN, P. C. JEPSON & J. BAKKER

112 Egg size, temperature and laying sequence: why do Snow Geese lay big eggs when it's cold?
T. D. WILLIAMS & E. G. COOCH

119 The role of an avian nectar robber and of Hummingbird pollinators in the reproduction of two plant species
M. C. ARIZMENDI, C. A. DOMÍNGUEZ & R. DIRZO

128 Optimal distribution of defences: are plants smart investors?
N. M. VAN DAM, T. J. DE JONG, Y. IWASA & T. KUBO

137 The influence of genetic and environmental factors on a quantitative defensive trait in Spruce
D. WAINHOUSE & R. ASHBURNER

Technical Report

144 An improved method for seed-bank analysis: seedling emergence after removing the soil by sieving
G. N. J. TER HEERDT, G. L. VERWEIJ, R. M. BEKKER & J. P. BAKKER

152 Erratum

153 Instructions to Contributors

Volume 10 Number 2 1996

157 Effects of elevated CO_2 on an artificial grassland community: competition, invasion and neighbourhood growth
J. STEWART & C. POTVIN

167 Scaling maximum growth rates across photosynthetic organisms
S. L. NIELSEN, S. ENRÍQUEZ, C. M. DUARTE & K. SAND-JENSEN

176 Seedling relative growth rate and its components in relation to seed size: phylogenetically independent contrasts
P. SWANBOROUGH & M. WESTOBY

185 Seasonal and latitudinal variation in supercooling ability of the House Spider, *Achaearanea tepidariorum* (Araneae: Theridiidae)
K. TANAKA

193 Desiccation and shelter-site use in a tropical amphibian: comparing toads with physical models
L. SCHWARZKOPF & R. A. ALFORD

201 Behavioural, thermal, and metabolic characteristics of a wintering lizard (*Anolis carolinensis*) from South Carolina
T. A. JENSSEN, J. D. CONGDON, R. U. FISCHER, R. ESTES, D. KLING, S. EDMANDS & H. BERNA

210 Life-history traits in parasitic nematodes: a comparative approach for the search of invariants
S. MORAND

219 Sources of variation in the foraging efficiency of grazing ruminants
I. J. GORDON, A. W. ILLIUS & J. D. MILNE

227 Scope for growth and fitness of *Daphnia magna* in salinity-stressed conditions
M. BAILLIEUL, M. SELENS & R. BLUST

234 The dynamics and scaling of foraging velocity and encounter rate in mammalian herbivores
L. A. SHIPLEY, D. E. SPALINGER, J. E. GROSS, N. THOMPSON HOBBS & B. A. WUNDER

245 Optimal resource allocation between growth and reproduction in clams: why does indeterminate growth exist?
M. HEINO & V. KAITALA

252 Some evidence for an adaptive linkage between leaf phenology and shoot architecture in sapling trees
K. KIKUZAWA, H. KOYAMA, K. UMEKI & M. J. LECHOWICZ

258 Root system topology of plants from habitats differing in soil resource availability
D. R. TAUB & D. GOLDBERG

265 Response of the tussock grass *Stipa tenacissma* to watering in a semi-arid environment
F. I. PUGAIRE, P. HAASE, L. D. INCOLL & S. C. CLARK

275 Nucleation processes in a Mediterranean bird-dispersed plant
M. VERDÚ & P. GARCÍA-FAYOS

281 Threshold size for vernalization in *Senecio jacobaea*: genetic variation and response to artificial selection
R. A. WESSELINGH & P. G. L. KLINKHAMER

289 Growth and morphology of *Scirpus lacustris* and *S. maritimus* seedlings as affected by water level and light availability
O. A. CLEVERING, C. W. P. M. BLOM & W.VAN VIERSSEN

Technical Report

297 An improved dynamic chamber technique for measuring CO_2 efflux from the surface of soil
C. FANG & J. B. MONCRIEFF

306 Erratum

Volume 10 Number 3 1996

307 How does variation in body composition affect the basal metabolic rate of birds?
I. SCOTT, P. I. MITCHELL & P. R. EVANS

314 Can high Arctic soil microarthropods survive elevated summer temperatures?
I. D. HODKINSON, S. J. COULSON, N. R. WEBB & W. BLOCK

322 A mathematical simulation of thermoregulatory behaviour in an orb-weaving spider
L. E. HIGGINS & E. EZCURRA

328 Exploitation of environmental heterogeneity by spatial division of labour in a clonal plant
J. F. STUEFFER, H. DE KROON & H. J. DURING

335 Nitrogen partitioning among photosynthetic components and its consequence in sun and shade plants
K. HIKOSAKA & I. TERASHIMA

344 Differences in the susceptibility to light stress between epiphytic lichens of ancient and young boreal forest stands
Y. GAUSLAA & K. A. SOLHAUG

355 Simulating a colour mutation: conspicuous red wings in the European Blackbird reduce the risk of attacks by Sparrowhawks
J. GÖTMARK

360 Sugar preferences of a nectarivorous passerine bird, the Lesser Double-collared Sunbird (*Nectarinia chalybea*)
C. N. LOTZ & S. W. NICOLSON

366 Countergradient variation in growth among newly hatched *Fundulus heteroclitus*: geographic differences revealed by common-environment experiments
E. T. SCHULTZ, K. E. REYNOLDS & D. O. CONOVER

375 Spatiotemporal patterns of sperm storage and last-male sperm precedence in birds
J. V. BRISKIE

384 Changes in life-history traits in the Fall Webworm within half a century of introduction to Japan
T. GOMI & M. TAKEDA

390 Effects of recent feeding on locomotor performance of juvenile *Psammodromus algirus* lizards
J. MARTIN

396 Retranslocation of shoot nitrogen to rhizomes and roots in prairie grasses may limit loss of N to grazing and fire during drought
S. A. HECKATHORN & E. H. DELUCIA

401 Plasticity of internodes and petioles in prostrate and erect *Potentilla* species
H. HUBER

410 Synergistic effects of grassland plant species on soil microbial biomass and activity: implications for ecosystem-level effects of enriched plant diversity
D. A. WARDLE & K. S. NICHOLSON

Technical Report

417 A method to access the below-ground part of a model spruce ecosystem
V. WIEMKEN & K. INEICHEN

Volume 10 Number 4 1996

Essay Review

421 Inferring multiple causality: the limitations of path analysis
P. S. PETRAITIS, A. E. DUNHAM & P. H. NIEWIAROWSKI

432 The use of a time and energy budget model of a parent bird to investigate limits to fledging mass in the Thick-billed Murre
A. I. HOUSTON, W. A. THOMPSON & A. J. GASTON

440 The rate of food processing in the Oystercatcher: food intake and energy expenditure constrained by a digestive bottleneck
M. KERSTEN & W. VISSER

449 Sonication dispensing of pollen from *Solanum laciniatum* flowers
M. J. KING & S. L. BUCHMANN

457 Effect of male mating history and body size on ejaculate size and quality in two polyandrous butterflies, *Pieris napi* and *Pieris rapae* (Lepidoptera: Pieridae)
C. J. BISSOONDATH & C. WIKLUND

465 Genetic variation in offspring condition: an experiment
J. MERILÄ

475 Daily energy expenditure and short-term reproductive costs in free-ranging Eurasian Kestrels (*Falco tinnunculus*)
K. I. JÖNSSON, E. KORPIMÄKI, I. PEN & P. TOLONEN

483 Responses to SO_2 pollution in 41 British herbaceous species
T. W. ASHENDEN, R. HUNT, S. A. BELL, T. G. WILLIAMS, A. MANN, R. E. BOOTH & L. POORTER

491 The photosynthetic capacity and leaf nitrogen concentration as related to light regime in shade leaves of a montane tropical forest tree, *Tetrorchidium rubrivenium*
N. P. R. ANTEN, R. HERNANDEZ & E. EDINA

501 Responses of West African forest tree seedlings to irradiance and soil fertility
E. M. VEENENDAAL, M. D. SWAINE, R. T. LECHA, M. F. WALSH, I. K. ABEBRESE & K. OWUSU-AFRIYIE

512 Adaptation and inertia in the Australian tropical lowland rain-forest flora: contradictory trends in intergeneric and intrageneric comparisons of seed size in relation to light demand
P. J. GRUBB & D. J. METCALFE

521 Oxygen stress in wetland plants: comparison of de-oxygenated and reducing root environments
H. BRIX & B. K. SORRELL

527 Below-ground microbial and microfaunal responses to *Artemisia tridentata* grown under elevated atmospheric CO_2
J. N. KLIRONOMOS, M. C. RILLIG & M. F. ALLEN

Technical Report

535 A simple red:far-red sensor using gallium arsenide phosphide detectors
J.-Y. PONTAILLER & B. GENTY

541 A new field technique for elevating carbon dioxide levels in climate change experiments
G. M. SPRING, G. H. PRIESTMAN & J. P. GRIME

Forum

546 Why are there no insects and so few higher plants, in the sea? New thoughts on an old problem
J. C. H. VAN DER HAGE

548 Measuring plant neighbour effects
J. H. MARKHAM & C. P. CHANWAY

Volume 10 Number 5 1996

551 A general model for the light-use efficiency of primary production
A. HAXELTINE & I. C. PRENTICE

562 Redistribution of the potential geographical ranges of Mistletoe and Colorado Beetle in Europe in response to the temperature component of climate change
C. E. JEFFREE & E. P. JEFFREE

578 Repeatability of aerobic performance in Red Junglefowl: effects of ontogeny and nematode infection
M. A. CHAPPELL, M. ZUK & T. S. JOHNSEN

586 Parasitism of baculovirus-infected *Plodia interpunctella* by *Venturia canescens* and subsequent virus transmission
S. M. SAIT, M. BEGON, D. J. THOMPSON & J. A. HARVEY

592 Analysis of aggregated parasite distributions: a comparison of methods
K. WILSON, B. T. GRENFELL & D. J. SHAW

602 Optimal resource allocation in a randomly varying environment
W. S. C. GURNEY & D. A. J. MIDDLETON

613 Habitat heterogeneity, environmental change, and the clonal structure of *Daphnia* populations
C. K. GEEDEY, A. J. TESSIER & K. MACHLEDT

622 Morphological divergence in an insular bat, *Lasiurus cinereus semotus*
D. S. JACOBS

631 Juvenile growth rate as a measure of fitness in *Daphnia*
W. LAMPERT & I. TRUBETSKOVA

636 Adaptability of leaves of *Cistus ladanifer* to widely varying environmental conditions
E. NÚÑEZ-OLIVERA, J. MARTÍNEZ-ABAIGAR & J. C. ESCUDERO

647 Regrowth of a semiarid shrub following simulated browsing: the role of reserve carbon
F. VAN DER HEYDEN & W. D. STOCK

654 Structural interdependence: an ecological consequence of morphological responses to crowding in marsh plants
C. D. G. HARLEY & M. D. BERTNESS

662 Growth responses to vesicular–arbuscular mycorrhizae and elevated CO_2 in seedlings of a tropical tree, *Beilschmiedia pendula*
C. E. LOVELOCK, D. KYLLO & K. WINTER

668 What makes a leaf tough and how this affects the pattern of *Castanopsis fissa* leaf consumption by caterpillars
M. F. CHOONG

Technical Report

675 Measuring energy metabolism with open-flow respirometric systems: which design to choose?
P. KOTEJA

Forum

678 Large grazers back in the fold: generalizing the prey model to incorporate mammalian herbivores
K. D. FARNSWORTH & A. W. ILLIUS

Volume 10 Number 6

681 Mate choice in male *Brachionus plicatilis* rotifers
A. GÓMEZ & M. SERRA

688 Reconstructing ancestral reaction norms: an example using the evolution of reptilian viviparity
C. P. QUALLS & R. SHINE

698 The causes of inherently slow growth in alpine plants: an analysis based on the underlying carbon economies of alpine and lowland *Poa* species
O. K. ATKIN, B. BOTMAN & H. LAMBERS

708 Effects of CO_2 concentration and water availability on growth and gas exchange in greenhouse-grown miniature stands of Loblolly Pine and Red Maple
J. W. GRONINGER, J. R. SEILER, S. M. ZEDAKER & P. C. BERRANG

717 The importance of tissue density for growth and life span of leaves and roots: a comparison of five ecologically contrasting grasses
P. RYSER

724 Premature dehardening in *Vaccinium myrtillus* during a mild winter: a cause for winter dieback?
E. ÖGREN

733 Effect of vertically transmitted ectoparasites on the reproductive success of swifts (*Apus apus*)
D. M. TOMPKINS, T. JONES & D. H. CLAYTON

741 Reproductive allocation in the terrestrial isopods *Porcellio scaber* and *Oniscus asellus* in a metal-polluted environment
D. T. JONES & S. P. HOPKIN

751 Repeatability of daily field metabolic rate in female Meadow Voles (*Microtus pennsylvanicus*)
D. BERTEAUX, D. W. THOMAS, J.-M. BERGERON & H. LAPIERRE

760 Pronounced seasonal differences in appetite of Atlantic Salmon parr, *Salmo salar*: effects of nutritional state and life-history strategy
A. L. SIMPSON, N. B. METCALFE, F. A. HUNTINGFORD & J. E. THORPE

768 Needle respiration and nitrogen concentration in Scots Pine populations from a broad latitudinal range: a common garden test with field-grown trees
P. B. REICH, J. OLEKSYN & M. G. TJOELKER

Technical Report

777 Physical stimulation of trees to study the effects of forest light environment, branch type and branch spacing on light interception and transmission
D. W. HILBERT & C. MESSIER

784 Erratum

785 Author Index

789 Subject Index